

## Claims

[c1] 1. An electronic circuit for a mechanically held contactor, the contactor changeable in state from ON to OFF or from OFF to ON, the circuit comprising:  
 a switch for providing an input signal;  
 a controller for receiving the input signal and sending an output signal; and,  
 a timing mechanism within the controller for setting a first period of time after receipt of the input signal and for setting a second period of time for limiting duration of the output signal;  
 wherein the output signal is not sent from the controller until the first period of time is completed.

[c2] 2. The electronic circuit of claim 1 further comprising an opto-coupler for passing the output signal from the controller.

[c3] 3. The electronic circuit of claim 2 further comprising a triac openable by the opto-coupler during the second period of time.

[c4] 4. The electronic circuit of claim 3 wherein an output pulse is passable through the triac when opened, the output pulse lasting the second period of time and causing the contactor to change its state.

[c5] 5. The electronic circuit of claim 1 wherein the output signal causes the contactor to change its state.

[c6] 6. The electronic circuit of claim 1 further comprising a registry within the controller for a value indicating the duration of the first time period.

[c7] 7. The electronic circuit of claim 1 further comprising an auxiliary contact status check station connected to the controller, wherein the controller checks status of the auxiliary contact during the first period of time.

[c8] 8. The electronic circuit of claim 7 wherein the controller alters state of an auxiliary contact during the output signal through the auxiliary contact status check station.

[c9] 9. The electronic circuit of claim 8 further comprising a registry within the

controller for registering a change in state of the auxiliary contact.

- [c10] 10.The electronic circuit of claim 9 wherein the output signal causes the contactor to change its state.
- [c11] 11.A contactor changeable in state from ON to OFF and from OFF to ON, the contactor comprising:
  - a pair of separable contacts;
  - an assembly for separating and bringing together the pair of separable contacts;
  - an energizable coil for moving the assembly in response to energization and de-energization of the coil; and,
  - an electronic circuit mounted adjacent the coil, the electronic circuit including a timing mechanism for setting a predetermined time period for energization of the coil.
- [c12] 12.The contactor of claim 11 wherein the electronic circuit includes a controller responsible for the timing mechanism, the controller sending an output signal for energizing the coil.
- [c13] 13.The contactor of claim 12 wherein the controller is responsive to an input signal and the timing mechanism sets a sleep period before the controller sends the output signal.
- [c14] 14.The contactor of claim 11 wherein the assembly comprises a magnet, an armature, and a main cam.
- [c15] 15.The contactor of claim 14 further comprising a contact module housing the pair of separable contacts.
- [c16] 16.The contactor of claim 15 wherein movement of the main cam initiates separation or abutment of the pair of separable contacts.
- [c17] 17.The contactor of claim 12 wherein the electronic circuit further comprises an opto-coupler for passing the output signal from the controller.
- [c18] 18.The contactor of claim 17 wherein the electronic circuit further comprises a

triac openable by the opto-coupler during the predetermined time period.

- [c19] 19.The contactor of claim 18 wherein the output signal is passable through the triac when opened, the output signal lasting the second period of time and causing the contactor to change its state.
- [c20] 20.The contactor of claim 12 wherein the output signal causes the contactor to change its state.
- [c21] 21.The contactor of claim 13 further comprising an auxiliary contact block and wherein the electronic circuit further comprises an auxiliary contact status check station connected to the controller, wherein the controller checks status of the auxiliary contact block during the sleep period.
- [c22] 22.The contactor of claim 21 wherein the controller alters state of the auxiliary contact block during the output signal through the auxiliary contact status check station.
- [c23] 23.The contactor of claim 22 further comprising a registry within the controller for registering a change in state of the auxiliary contact.
- [c24] 24.The contactor of claim 11 wherein the electronic circuit is encased within a housing separate from the contactor.
- [c25] 25.The contactor of claim 24 wherein the housing is mounted upon a coil cover covering the coil.
- [c26] 26.The contactor of claim 24 wherein the housing includes a cutout disposed therein, the cutout positioned proximate to the assembly, the cutout allowing manual access to the assembly.
- [c27] 27.A method of utilizing an electronic circuit in a mechanical contactor, the method comprising:
  - initiating an input signal in the electronic circuit;
  - receiving the input signal within a controller;
  - waiting a first predetermined period of time for avoiding bounce from the input signal;

at an end of the first predetermined period of time, sending an output signal from the controller for a duration lasting a second predetermined period of time; and,  
applying control power to a contact coil of the mechanical contactor during the second predetermined period of time.

- [c28] 28.The method of claim 27 wherein initiating the input signal comprises moving a switch.
- [c29] 29.The method of claim 28 further comprising sending the input signal over a line connecting the switch and the controller.
- [c30] 30.The method of claim 27 further comprising passing the output signal through an opto-coupler.
- [c31] 31.The method of claim 30 further comprising opening a triac for the second predetermined period of time and allowing the output signal to pass through.
- [c32] 32.The method of claim 27 further comprising changing state of the contactor after applying control power to the contactor coil.
- [c33] 33.The method of claim 27 further comprising checking status of an auxiliary contact during the first predetermined period of time and sending the output signal from the controller only if the auxiliary contact is in a non-activated state.
- [c34] 34.The method of claim 33 further comprising changing state of the auxiliary contact during the second predetermined period of time.
- [c35] 35.The method of claim 34 further comprising registering the state of the auxiliary contact within the controller.
- [c36] 36.The method of claim 35 further comprising withdrawing the input signal after state of the contactor and state of the auxiliary contact have been changed, waiting the first predetermined period of time, sending another output signal to restore the contactor to its original state, and reversing the state of the auxiliary contact.

- [c37]        37.The method of claim 27 wherein the first predetermined period of time is approximately 25 milli-seconds.
- [c38]        38.The method of claim 27 wherein the second predetermined period of time is approximately 60 milli-seconds.
- [c39]        39.The method of claim 27 further comprising disconnecting control power to the contact coil of the mechanical contactor after the second predetermined period of time.

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